Water Quality Technical Memorandum

Arcade-Cripple Creek Trail (Sylvan Road to Stock Ranch) Extension Project



City of Citrus Heights, Sacramento County, California

District 3-SAC

CRP 5475(053)

March 2026

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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STATE OF CALIFORNIA

Department of Transportation

Prepared By: _____ Date: 3/5/26

Amy Bakker/Senior Environmental Planner
916-858-0642
Dokken Engineering
110 Blue Ravine Road, Suite 200
Folsom, CA 95630

Approved By: _____ Date: 3/30/26

Daniel Kehrer, Principal Civil Engineer
(916) 727-4770
City of Citrus Heights General Services Department
6360 Fountain Square Drive
Citrus Heights CA 95621

Approved By: Caitlin Greenwood Date: 3/30/2026

Caitlin Greenwood, Associate Environmental Planner
530-682-2984
Local Assistance–Environmental Support
Caltrans, District 3

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EXECUTIVE SUMMARY

The City of Citrus Heights (City) proposes to construct the Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project (Project), a 0.5-mile addition to the planned 16-mile Creek Corridor Trail Project (CCTP). The purpose of this Project is to close a gap in the existing trail system by replacing dirt and narrow concrete paths with an Americans with Disabilities Act (ADA) compliant Class I multi-use trail. This trail extension is needed to enhance pedestrian and bicycle connectivity, provide a safe recreational facility, and improve access through the Arcade Creek greenbelt.

The Biological Study Area (BSA) includes two aquatic features: Arcade Creek and Arcade Creek tributary (perennial stream channel) and two water quality/detention basins. Arcade Creek is the main surface water feature within the Project area that will be permanently impacted by the Project. Arcade Creek within the Project area is 303(d) listed and considerations for Total Maximum Daily Loads (TMDLs) (Caltrans 2025) for the following:

- Bifenthrin
- Copper
- Fipronil Sulfone
- Malathion
- Permethrin
- Pyrethroids
- Toxicity

Arcade Creek and the Arcade Creek tributary are also jurisdictional waters of both the U.S. and the state, whereas the associated water quality/detention basins are considered waters of the state only. These surface waters are regulated under Section 401 of the Clean Water Act (CWA), as administered by the Regional Water Quality Control Board (RWQCB), and Arcade Creek and its tributary are additionally subject to Section 404 permitting. The California Department of Fish and Wildlife (CDFW) also asserts jurisdiction over the bed, bank, and channel of these waters, as well as any associated riparian vegetation. The following permits will be obtained for the proposed Project prior to construction: Section 401 Water Quality Certification from the RWQCB, non-reporting Section 404 Nationwide Permit 14, and a Section 1602 Streambed Alteration Agreement from CDFW.

The Project would result in an increase of approximately 0.47 acre of new impervious surface, which would contribute to an increase in the volume of storm water runoff from the multi-use trail surface that could enter the drainage system and eventually the waterways within the Project. Impacts to water quality may result from sediment-laden storm water discharged into these waterways. With the inclusion of permanent treatment control Best Management Practices (BMPs), Project impacts to water quality would not be substantial.

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ACRONYMS LIST

ADA	Americans with Disabilities Act
ASBS	Areas of Special Biological Significance
Basin Plan	Water Quality Control Plan
BMPs	Best Management Practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CCTP	City's Creek Corridor Trail Project
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIP	California Improvement Plan
City	City of Citrus Heights
COI	Change of Information
CWA	Clean Water Act
DSA	Disturbed Soil Area
DMP	Drainage Master Plan
EFH	Essential Fish Habitat
ESA	Environmentally Sensitive Areas
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
General Plan	City of Citrus Heights General Plan
HAPC	Habitat Areas of Particular Concern
LEDPA	Least Environmentally Damaging Practicable Alternative
MS4s	Municipal Separate Storm Sewer Systems
msl	Mean Sea Level
NAL	Numeric Action Level
NELs	Numeric Effluent Limits
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Services
NWPT	Northwestern Pond Turtle
PFMC	Pacific Fishery Management Council
PRDs	Permit Registration Documents
Project	Arcade-Cripple Creek Trail (Sylvan Road to Stock Ranch) Extension Project
QPEs	Qualifying Precipitation Events
QSD	Qualified Stormwater Developer
QSP	Qualified Stormwater Practitioner
R factor	Rainfall-runoff erosivity factor
RL	Risk Level

ROW	Right-of-Way
RUSLE	Revised Universal Soil Loss Equation
RWQCB	Regional Water Quality Control Board
SMARTS	Stormwater Multiple Application and Report Tracking System
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDLs	Total Maximum Daily Loads
U.S. EPA	United States Environmental Protection Agency
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VELB	Valley Elderberry Longhorn Beetle
WDID	Waste Discharge Identification Number
WDRs	Waste Discharge Requirements
WPCP	Water Pollution Control Plan (or Program)
WQAR	Water Quality Assessment Report

1 INTRODUCTION

1.1 Approach to Water Quality Assessment

The purpose of the Water Quality Assessment Technical Memorandum (WQAR) is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information for National Pollutant Discharge Elimination System (NPDES) permitting. The document includes a discussion of the proposed Project, the general environmental setting of the Project area, and the regulatory framework with respect to water quality. It also provides data on surface water and groundwater resources within the Project area and the water quality of these waters, describes water quality impairments and beneficial uses, identifies potential water quality impacts/benefits associated with the proposed Project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

1.2 Project Description

The City of Citrus Heights proposes to construct a 0.5-mile addition to the planned 16-mile CCTP as part of the Project (Figure 1. Project Location; Figure 2. Project Vicinity). The Project is funded through the federal Carbon Reduction Program and therefore requires compliance with both NEPA and CEQA. The lead agency for CEQA compliance is the City of Citrus Heights and the federal lead agency for NEPA compliance is the California Department of Transportation (Caltrans).

The Project is located in the City of Citrus Heights and will extend east from the existing Stock Ranch Trail behind the Costco/Walmart shopping center to Sylvan Road. The proposed alignment begins south of the Walmart property boundary and proceeds east through the Stock Ranch Nature Preserve, curving south around Walmart's water quality detention basin. The alignment continues north, crossing a tributary of Arcade Creek, and traverses along the south side of the Huntington Square Apartments complex prior to connecting to Sylvan Road. The alignment terminates east of Sylvan Road at the location of a planned future trail extension segment from Sylvan Road to Mariposa Avenue. The Project has independent utility and would function as a stand-alone improvement.

Proposed facilities include a paved trail, a new prefabricated bridge across the unnamed creek tributary, solar lighting, bank protection along a segment of Arcade Creek, and an at-grade signalized pedestrian crossing at Sylvan Road (Figure 3. Project Features). Construction activities will involve grading to achieve ADA-compliant slopes, installing the creek crossing, paving the trail, erecting the solar lighting, constructing bank protection, and adding pedestrian signal infrastructure with minor utility adjustments as needed.

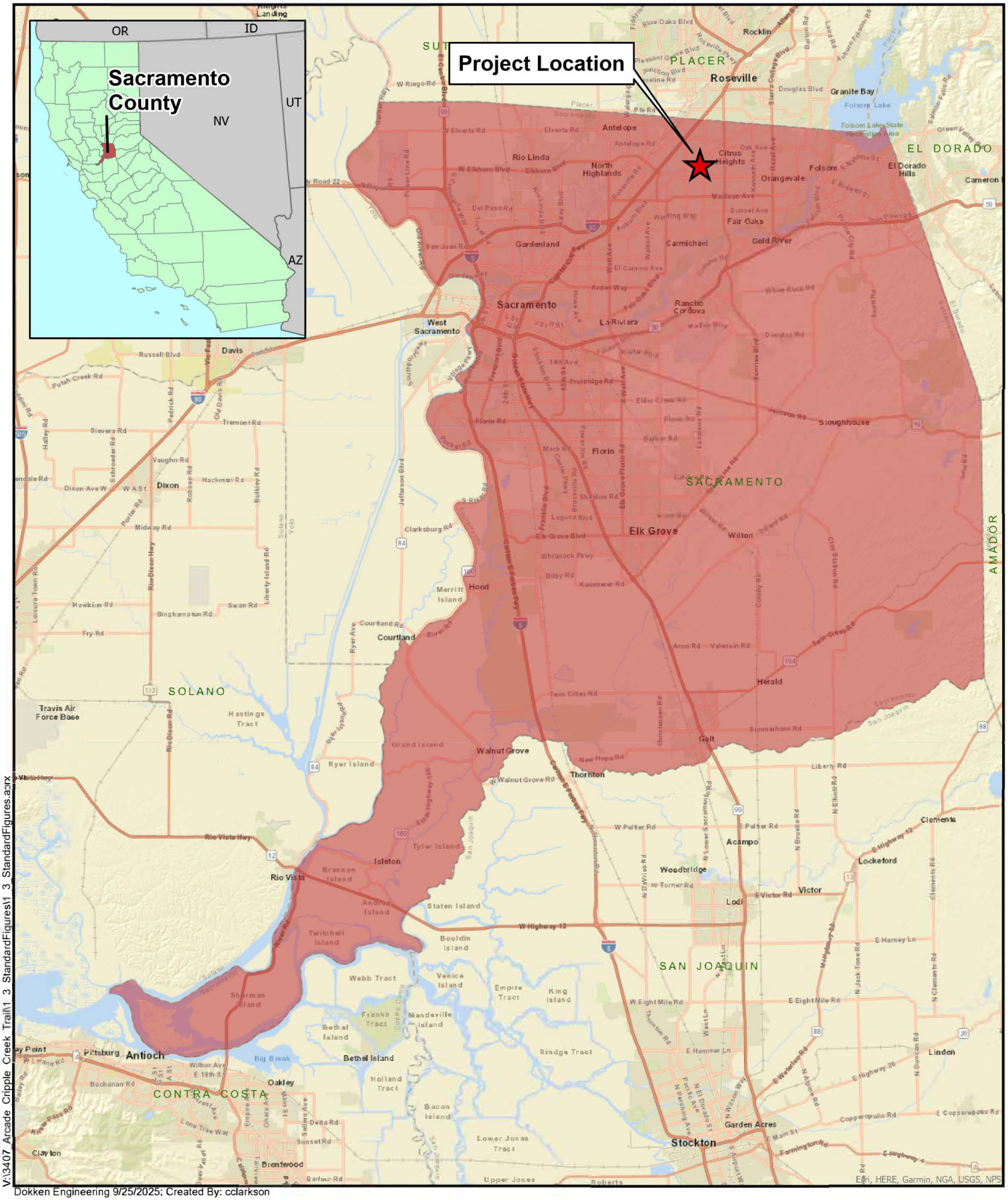
To accommodate construction, right-of-way (ROW) acquisitions will be required from several parcels. These include a permanent easement and permit to enter (PTE) from the Sunrise Recreation & Park District and a TCE from Walmart. An existing trail easement exists across the Huntington Square Apartments property and there is potential for this permanent easement to be modified to best incorporate the trail alignment with the physical site features.

Construction access will be provided primarily through the Walmart parking lot under a TCE, as well as a permit to enter for access from the Huntington Square Apartments

parcel. These provisions will allow safe and efficient construction of the trail and its associated improvements.

1.3 Project Purpose

The purpose of this Project is to close a gap in the existing trail system by replacing dirt and narrow concrete paths with an Americans with Disabilities Act (ADA) compliant Class I multi-use trail. This trail extension is needed to enhance pedestrian and bicycle connectivity, provide a safe recreational facility, and improve access through the Arcade Creek greenbelt.



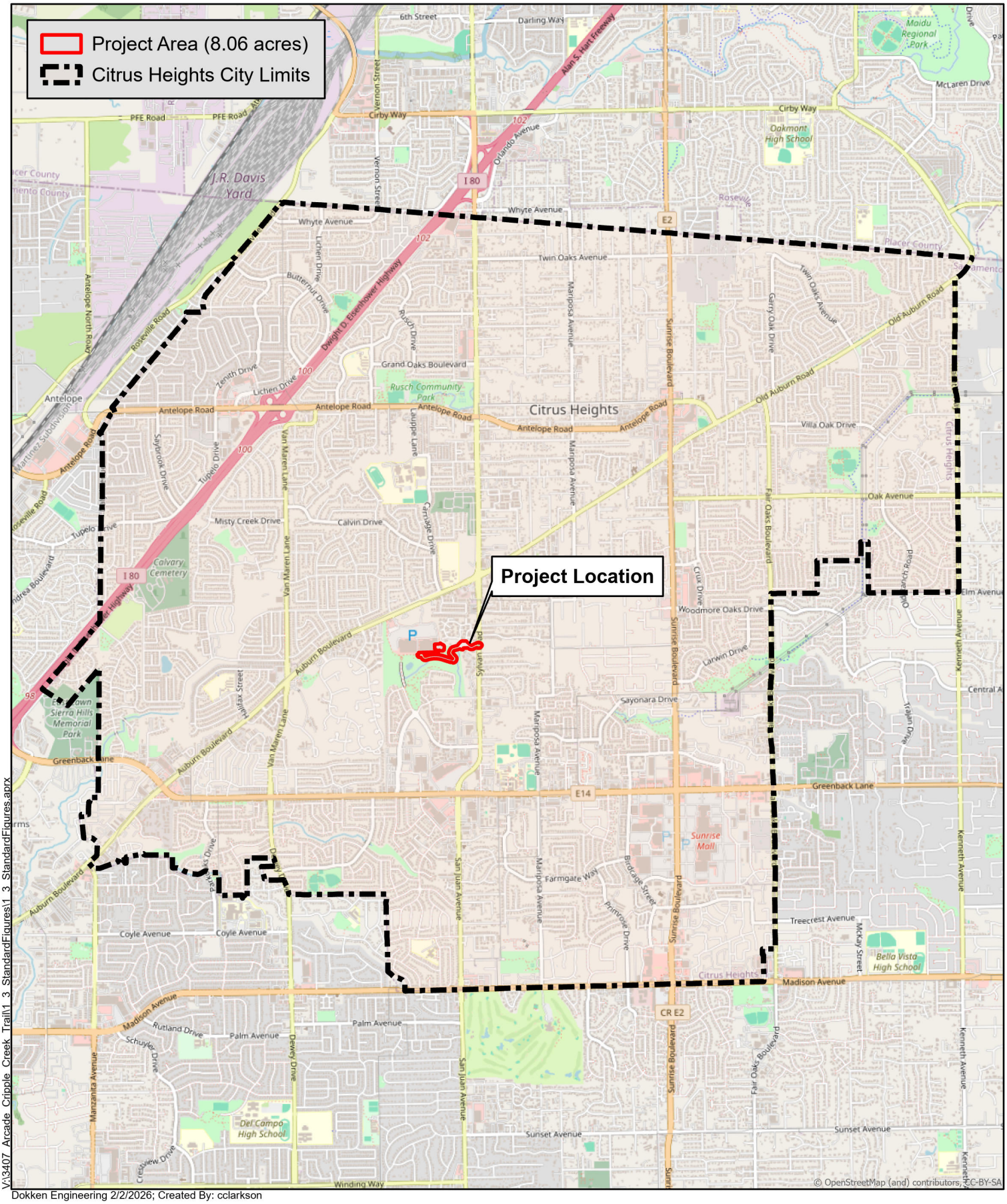
V:\3407 Arcade Cripple Creek Trail\1 3 StandardFigures\1 3 StandardFigures.aprx

Dokken Engineering 9/25/2025; Created By: cclarkson

0 3.5 7 Miles

Figure 1
Project Vicinity

Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project
Citrus Heights, Sacramento County, California



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Dokken Engineering 2/2/2026; Created By: cclarkson

0 1,750 3,500

Feet

Figure 2
Project Location

Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project
Citrus Heights, Sacramento County, California



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Source: Dokken Engineering 2/4/2026; Created By: kjacobson

0 75 150 Feet

Figure 3
Project Features
Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project
Citrus Heights, Sacramento County, California

2 REGULATORY SETTING

2.1 Federal Laws and Requirements

Clean Water Act

In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the U.S. from any point source unlawful unless the discharge is in compliance with a NPDES permit. Known today as the CWA, Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the State that the discharge would comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request. See below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and MS4s.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the USACE.

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

Section 404 Permitting

USACE issues two types of 404 permits: General and Standard permits. For General permits there are two types: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE’s Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (EPA) Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative that would

have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative, to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

2.2 State Laws and Requirements

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne) is the principal law governing water quality regulation in California. This statute established the State Water Resources Control Board (SWRCB) and the nine RWQCBs, which are charged with implementing its provisions. Porter-Cologne establishes a comprehensive program for the protection of water quality and the beneficial uses of water. It applies to surface waters, wetlands, and groundwater and to both point and nonpoint sources. Porter-Cologne is found in the California Water Code beginning with Section 13000. In addition, Title 23 of the California Code of Regulations (CCR) contains administrative and regulatory elements of water quality and quantity management in California. The SWRCB was formed in 1967 when the State Water Rights Board and the SWQCB were merged by the State Legislature, based on the realization that decisions affecting water quality and water rights are inseparable. Under its dual legal authority, the SWRCB allocates rights to the use of surface water and, together with the nine RWQCBs, protects water quality in all waters of the state. The project area is located within Region 5 — the Central Valley RWQCB. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. The RWQCBs have responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. Porter-Cologne also incorporates many provisions of the CWA such as delegation to the SWRCB and RWQCBs of the National Pollutant Discharge Elimination System (NPDES) permitting program.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of stormwater dischargers, including MS4s. The City of Citrus Heights along with the Cities of Elk Grove, Folsom, Galt, Rancho Cordova, and Sacramento, and the County of Sacramento operate under a MS4 permit to discharge urban runoff from in their municipal jurisdictions (Order No. R5-2016-0040 with the Citrus Heights-specific General Order No. as R5-2016-0040-004 and NPDES Permit No. CAS0085324) (Central Valley RWQCB 2016). The permit covers requirements for management of hydromodification and requires that the City prepare a SWMP (also known as Stormwater Quality Improvement Plans) and impose water quality and watershed protection measures for all development projects. The intent of the WDRs in the NPDES Permit is to attain water quality standards and protection of beneficial uses consistent with the Water Quality Control Plan (Basin Plan). The NPDES permit prohibits discharges from causing violations of applicable water quality standards or resulting in conditions that create a nuisance or water quality impairment in receiving waters. The NPDES also requires every new construction project to secure a permit that implements the following measures:

- Eliminate or reduce non-stormwater discharges to stormwater systems and other waters of the nation.
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP).
- Perform inspections of stormwater control structures and pollution prevention measures.

Stormwater quality control measures within the City of Citrus Heights are guided by the Sacramento Region Stormwater Quality Design Manual (City of Sacramento 2018). The manual outlines planning tools and requirements to reduce urban runoff pollution to the maximum extent practicable from new development and redevelopment projects, including the use of porous surfaces on roadways.

Construction General Permit

The Construction General Permit (NPDES No. CAS000002, SWRCB Order No. 2022-0057-DWQ) and effective on September 1, 2023. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective SWPPP.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than one acre is subject to this CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop SWPPPs; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The CGP separates projects into Risk Levels 1, 2, or 3. Risk Levels are determined during the planning and design phases and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows. Based on preliminary analysis, the Risk Level for this project is estimated to be a Level 1. Additional hydraulic analysis will take place prior to final design to confirm the ultimate Risk Level and extent of BMP implementation for the project.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project would be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Section 1602: Streambed Alteration Agreement

Under CFG Code 1602, public agencies are required to notify CDFW before undertaking any project that will: substantially divert or obstruct the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or deposit debris, waste or other materials that could pass into any river, stream or lake. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource within CDFW jurisdiction may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resources. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project

2.3 Regional and Local Requirements

Regional Water Quality Control Board (RWQCB) Basin Plan

The Project is under the jurisdiction of the Central Valley RWQCB. The Central Valley RWQCB implements the Basin Plan for the California Regional Water Quality Control Board Central Valley Region: The Sacramento River Basin and the San Joaquin River Basin (Central Valley RWQCB 2019) to regulate surface and groundwater quality in the region. The Basin Plan lists beneficial uses and water quality objectives to protect resources within its jurisdiction.

Stormwater Management Plan

In 2007, Sacramento County and the cities of Citrus Heights, Elk Grove, Folsom, Galt, Rancho Cordova, Roseville, and Sacramento created the Stormwater Quality Design Manual for the Sacramento and South Placer Regions. The manual describes selection measures for source pollution and stormwater treatment for new development. In 2018, the partnership updated the manual to include information from the original as well as hydromodification management and low-impact development design standards (City of Sacramento 2018).

City of Citrus Heights Drainage Master Plan

In 2010 the City of Citrus Heights adopted a comprehensive Drainage Master Plan (DMP) to guide improvements to the existing storm drainage and flood control system. The DMP provides a range of drainage concepts intended to upgrade the City's drainage infrastructure and address identified deficiencies. Between 2012 and 2016, the City completed five phases of the DMP, prioritizing areas that lacked a defined drainage system. Six additional phases remain to be completed (DMP 2025). The DMP identifies and evaluates drainage deficiencies throughout the City and was developed to reduce or eliminate localized flooding and drainage problems. Implementation of the DMP falls within the City's Capital Improvement Program (CIP), which outlines long-term investments in infrastructure and projects designed to enhance community services and facilities. The CIP serves as a five-year budgeting and planning tool, is reviewed by the Planning Commission for consistency with the City of Citrus Heights General Plan (General Plan) and is adopted by the City Council. The Project will comply with the adopted DMP and any future updates approved prior to construction.

City of Citrus Heights General Plan

The policies below are excerpted from the City's General Plan (City of Citrus Heights 2011a). These policies are designed to ensure that the water supply is clean and safe within the City's jurisdiction.

> **Policy 49.1**: Continue to implement floodplain zoning and undertake other actions required to comply with State and federal floodplain development requirements and maintain the City's eligibility under the National Flood Insurance Program.
>
> **Policy 49.2**: Integrate sustainable stormwater management techniques in site design to reduce stormwater runoff and control erosion.
>
> **Policy 49.3**: Require evaluation of potential flood hazards prior to approval of development projects.

Policy 49.8: Reduce pollutants being discharged into the drainage system to the maximum extent feasible to meet required federal National Pollution Discharge Elimination System standards.

3 AFFECTED ENVIRONMENT

This affected environment section describes the environmental characteristics within the proposed Project area. Population, land use, topography, regional and local hydrology, groundwater hydrology, geology/soils, biological communities, water quality standards, and beneficial uses are discussed.

3.1 General Environmental Setting

The Project is centrally located in the City of Citrus Heights, within Section 26, Township 10 North, Range 6 East. It is within the USGS Citrus Heights 7.5-minute topographic quadrangle. The Project area runs through the Arcade Creek greenbelt within the Sunrise Recreation and Parks District in the Stock Ranch Nature Preserve, adjacent to Van Maren Park. The proposed segment is from Sylvan Road to Stock Ranch, connecting to existing trails. The Project area includes Arcade Creek. Arcade Creek is a natural riverine corridor that flows east to west through northern Sacramento County.

Population and Land Use

According to the U.S. Census, the City of Citrus Heights has a total population of 86,909 as of 2024 (U.S. Census 2024). The population has decreased approximately 0.8% since 2020. Land uses within the Project area are a mixture of General Commercial, Low and Medium Density Residential, and Open Space (City of Citrus Heights 2020). The undeveloped area within the Project area containing Arcade Creek is designated as Open Space and is in the Stock Ranch Nature Preserve. This preserve functions as a park for the community and includes floodways and manmade stormwater detention basins.

Topography

The topography within the Project is flat and the elevation ranges between approximately 125 feet to 140 feet above mean sea level (msl). Appendix A. Natural Resources Conservation Service (NRCS) Custom Soil Resource Report (**Appendix A**; **NRCS 2025**) was queried for the Project, and the soil types within the BSA include Fiddyment-Orangevale complex, 2 to 8 percent slopes (95.5% of the BSA) and Fiddyment-Orangevale-Urban land complex, 2 to 8 percent slopes (4.5% of the BSA) (NRCS 2025).

Hydrology

Regional and Local Hydrology

The Project is located within Sacramento County. The mainstem of Arcade Creek, which originates in Orangevale and flows into the Natomas East Main Drainage Canal, is approximately 16.2 miles long with a watershed area of about 29.7 square miles. It ultimately discharges to the Sacramento River. Within the BSA, the Arcade Creek channel also includes a perennial tributary which splits off from the mainstem south of Huntington Square Lane (Figure 4. Waters and Vegetation Communities). Historic aerial imagery indicates that the tributary once flowed south from Auburn Boulevard, but over time



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0 75 150 Feet

Figure 4
Waters and Vegetation Communities
Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project
Citrus Heights, Sacramento County, California

residential development shortened the channel, leaving only a remnant of the original tributary. The Arcade Creek channel and its tributary are part of the Arcade Creek watershed, a small, urbanized watershed covering approximately 38 square miles. Surrounding land use in the Arcade Creek watershed is primarily residential and commercial with transportation infrastructure such as roads, trails and parking lots. Historically, Arcade Creek functioned as a seasonal stream that carried water predominantly during the winter and spring months. In some years, portions of the creek and its tributaries would completely dry out during the summer. With increasing urbanization, the creek transitioned to a perennial system, likely beginning around 60 years ago. Today, dry-weather flows are sustained by inputs such as landscape irrigation runoff, car washing, industrial discharges, and other non-stormwater sources, resulting in Arcade Creek maintaining continuous flow throughout the year. Most surface water within Arcade Creek is urban runoff (City of Sacramento 2003). Arcade Creek is the main surface hydrological feature in the City of Citrus Heights.

Precipitation and Climate

Sacramento County experiences a mediterranean climate consisting of hot, dry summers and cool, wet winters. The average annual high temperature is approximately 75 degrees Fahrenheit (°F), and the average annual low temperature is approximately 49°F. The region averages 18.14 inches of precipitation annually (U.S. Climate Data 2025).

Surface Water

Two aquatic feature types were observed within the BSA during the October 2025 biological survey: Arcade Creek (perennial stream channel), which was discussed above, and two manmade water quality/detention basins.

Water Quality/Detention Basins

During the October 2025 field survey, two water quality/detention basins were documented within the BSA. These areas are gently sloping, engineered depressions designed to capture and temporarily detain stormwater runoff.

The western basin was completely dry at the time of the survey. However, recent aerial imagery (from November 2023) indicates that the area becomes inundated with water during heavy rain events caused by stormwater runoff from the adjacent commercial and residential areas. The basin supports annual grassland habitat dominated by spikeweed (*Centromadia fitchii*) and wild oat (*Avena fatua*) which appeared to have been recently trimmed.

The eastern basin was full of water at the time of the survey. This basin is supplied by a small stream channel to the north, which collects stormwater runoff from adjacent residential homes to the east and the paved parking lot to the west. The connected stream channel originates at the homes along Gallant Circle and flows south and southeast before reaching the basin. According to historic aerial imagery, this basin tends to hold water longer than the western basin, allowing it to grow hydrophytic vegetation species such as broadleaf cattail (*Typha latifolia*), tule (*Schoenoplectus acutus* var. *occidentalis*), cottonwoods (*Populus fremontii*) and willow trees (*Salix lasiolepis, Salix gooddingii*). At the time of the survey, the cattails and tules in the channel appeared to be in poor health

and recently trimmed. The BSA contains approximately 1.89 acres (5%) of water quality/detention basins.

Because these basins are artificial ponds constructed in dry land for stormwater treatment and detention, they fall under the exclusion at 40 CFR § 120.2(b)(5) and therefore do not meet the current definition of waters of the U.S. In addition, permitting under Section 401 of the CWA is not warranted as there is little to no risk of discharge to another water body and there is no potential for the Project improvements to encroach on these features.

Areas of Special Biological Significance (ASBS)

Areas of Special Biological Significance (ASBS) are ocean areas monitored and maintained for water quality by the State Water Resources Control Board. ASBS cover much of the length of California's coastal waters. They support an unusual variety of aquatic life, and often host unique individual species. ASBS are basic building blocks for a sustainable, resilient coastal environment and economy. According to the map provided by the State Water Resources Control Board (SWRCB 2017), there are no Areas of Special Biological Significance sites within the BSA.

Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map designates the Project area within three zones: Zone X, Zone AE, and Regulatory Floodway. Zone X signifies a minimal flood hazard area with a 0.2% annual chance of flooding. Zone AE designates areas that are within the 100-year base flood zone and have a 1% annual chance of flooding. The Regulatory Floodway is designated as a special flood hazard area within the 100-year base flood zone and a 1% annual chance of flooding (**Appendix B. FEMA FIRMette Map**).

Municipal Supply

According to the City of Citrus Heights Background Report, water supply in the City consists of both surface water and groundwater sources. Urban runoff from residential and commercial irrigation, driveway and parking lot cleaning, swimming pool draining, precipitation events, and snowmelt from the Sierra Nevada are the main sources of surface water supply in the City. However, a majority of the City's water supply comes from groundwater (City of Citrus Heights 2020b). The Sacramento County Water Agency is the water service provider within the Project area. There are no water recharge facilities within the Project area.

Groundwater Hydrology

The City of Citrus Heights is located on the Fair Oaks Geologic Formation (City of Citrus Heights 2020b). This geologic formation is comprised of relatively thick deposits of silt and clay with thinner deposits of sand and gravel. The Fair Oaks Formation can yield moderate to high quantities of water, primarily dependent upon whether fine grained or coarse material is present (City of Citrus Heights 2020b). Wells to depths greater than 300 feet may encounter the underlying Mehrten Formation, with water yields roughly equivalent to the Fair Oaks Formation. Groundwater in the vicinity of Citrus Heights

generally flows to the west and ranges in depth from approximately 80 feet above msl in the east to 20 feet below msl in the west (County of Sacramento 1996).

Geology/Soils

The soil types within the Project area include Fiddyment-Orangevale complex, 2 to 8 percent slopes and Fiddyment-Orangevaile-Urban land complex, 2 to 8 percent slopes (NRCS 2025). The erodibility factor (K-factor) for this area is 0.43, indicating that soils are moderately susceptible to particle detachment, and that it produces runoff at moderate rates (Caltrans 2025). The Project area is also categorized as hydrologic soil group type 'B' which consists of moderately deep and well drained soils with moderately fine to course textures (Appendix A).

Biological Communities

Aquatic Habitat

Aquatic habitat in the Project area includes Arcade Creek (perennial stream channel) and two manmade water quality/detention basins.

Special Status Species

Literature research, habitat assessments, and biological surveys determined that the Project area was potentially suitable for the following special status species: chinook Salmon Central Valley spring-run ESU (*Oncorhynchus tshawytscha* pop. 11), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus* [VELB]), song sparrow ("Modesto" population) (*Melospiza melodia* pop. 1), Swainson's hawk (*Buteo swainsoni),* northwestern pond turtle (*Actinemys marmorata* [NWPT]), and Sanford's arrowhead (*Sagittaria sanfordii*).

Stream/Riparian Habitats

The BSA contains approximately 4,465 linear feet of Arcade Creek and it's tributary (Figure 4) This segment of Arcade Creek within the BSA is bordered by riparian, annual grasslands, and urban habitat communities and flows northeast to southwest. Dominant vegetation observed within the bed and banks of Arcade Creek and its tributary includes southern catalpa trees (*Catalpa speciosa*), common knotweed (*Persicaria lapathifolia*), interior live oak trees (*Quercus wislizeni*) and Himalayan blackberry (*Rubus armeniacus*). Arcade Creek and its tributary comprise approximately 2.69 acres (7%) of the BSA.

Wetlands

Jurisdictional delineations were conducted by Dokken Engineering biologists, Caroline Clarkson and Katie Jacobson on October 17, 2025 to identify jurisdictional resources present within the BSA. No wetlands were identified during the jurisdictional delineation survey (Figure 4). Wetland delineations were conducted in accordance with technical methods outlined in the Corps of Engineers Wetlands Delineation Manual (USACE 1987), Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008), and A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States (Lichvar 2008).

Arcade Creek is the main surface hydrological feature in the City Citrus Heights. Two aquatic feature types were observed within the BSA during the October 2025 biological survey: Arcade Creek (perennial stream channel) and two water quality/detention basins (Figure 4).

3.2 Water Quality Objectives/Standards and Beneficial Uses

Surface Waters

Water quality is most affected by land development, agriculture, grazing, and urban runoff. Constituents found in urban runoff vary during a storm event, from event to event within a given area, and from area to area within a given watershed. Variances can be the result of differences in rainfall intensity and occurrence, geographic features, and the land use of the area, as well as vehicle traffic and the percentage of impervious surface. Furthermore, sediment runoff from construction sites without adequate erosion control measures can contribute to sediments, pesticides, fertilizers, and other pollutants to receiving waters.

As required by the Porter-Cologne Act, the Central Valley RWQCB has developed water quality objectives for waters within their jurisdiction to protect the beneficial uses of those waters and published them in their Basin Plan. The Basin Plan also establishes implementation programs to achieve these water quality objectives and requires monitoring to evaluate the effectiveness of these programs. Water quality objectives must comply with the state antidegradation policy (SWRCB 1968), which generally restricts the reduction of water quality of surface or ground waters even though such a reduction in water quality might still allow the protection of the beneficial uses associated with the water prior to the quality reduction. The Central Valley RWQCB intends to maintain this quality with enforcement of the water quality objectives summarized in Table 2. Central Valley RWQCB Water Quality Objectives for Inland Surface Waters (Central Valley RWQCB 2019).

Table 1. Central Valley RWQCB Water Quality Objectives for Inland Surface Waters

Constituent	Water Quality Objective
Bacteria	In waters designated REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than 10 percent of the total number of samples taken during any 30-day period exceed 400/100 mL.
Biostimulatory Substances	Water shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, water designated MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section Consumer Acceptance Limits) and

Constituent	Water Quality Objective
	64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. (See below for specific chemical constituent objectives for specific water bodies.
Cryptosporidium and *Giardia*	Waters shall not *contain Cryptosporidium* and *Giardia* in concentrations that adversely affect the public water system component[1] of the MUN beneficial use. This narrative water quality objective for *Cryptosporidium* and *Giardia* shall be applied within the Sacramento-San Joaquin Delta and its tributaries below the first major dams and should be implemented as specified in Chapter 4 of the Basin Plan. Compliance with this objective will be assessed at existing and new public water system intakes. [1] Public water system as defined in Health and Safety Code, section 116275, subdivision (h)
Color	Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen	For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time: • Waters designated WARM 5.0 mg/l • Waters designated COLD 7.0 mg/l • Waters designated SPWN 7.0 mg/l
Floating Material	Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5.
Pesticides	• No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. • Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses. • Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer. • Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 CFR Section 131.12.). • Pesticide concentrations shall not exceed the lowest levels technically and economically achievable. • Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California CFR, Title 22, Division 4, Chapter 15.

Constituent	Water Quality Objective
	• Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l. For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. At a minimum, waters designated MUN shall not contain concentrations of radionuclides in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22, California Code of Regulations.
Salinity	Electrical Conductivity (at 25°C) shall not exceed 150 micromhos/cm (90 percentile) in well-mixed waters of the Feather River.
Sediment	The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to domestic or municipal water supplies.
Temperature	Elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5 degrees Fahrenheit above natural receiving water temperature. In determining compliance with the above limits, the Central Valley Regional Water Quality Control Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, biotoxicity tests of appropriate duration, or other methods as specified by the Central Valley Regional Water Quality Control Board.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Constituent	Water Quality Objective
	Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2 Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU. • Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. • Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.
Source: Central Valley RWQCB 2019	

Under the Porter-Cologne Water Quality Control Act, the RWQCB is required to consider beneficial uses when instituting water quality objectives and described these beneficial uses as follows:

"Beneficial uses of the waters of the State that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves."

The RWQCB separates beneficial uses into two categories: consumptive uses corresponding to reduction and/or depletion of water supply and non-consumptive uses not associated with significantly depleting water supplies. The RWQCB assigns beneficial uses for tributary streams based on the uses assigned to the named waterbody that the tributary connects with.

. Existing beneficial uses of surface waters within the “Colusa Basin Drain to I Street Bridge” which includes Arcade Creek and its associated tributaries are defined in Table 2 below:

Table 2. Existing and Potential Beneficial Uses

Beneficial Use	Definition
MUN	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
AGR	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.
REC-1	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
REC-2	Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These

Beneficial Use	Definition
	uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
WARM	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
COLD	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates
MIGR	Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.
SPWN	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
WILD	Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
NAV	Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
Source: Central Valley RWQCB 2019	

List of Impaired Waters

303(d) listed waters are a State's list of impaired and threatened waters (e.g. stream/river segments, lakes). States are required to submit their list for EPA approval every two years. For each water on the list, the State identifies the pollutant causing the impairment, when known. In addition, the state assigns a priority for development of Total Maximum Daily Loads (TMDL) based on the severity of the pollution and the sensitivity of the uses to be made of the waters. Arcade Creek within the Project area is 303(d) listed and considerations for TMDLs (Caltrans Water Quality Planning Tool, 2024) for the following:

- Bifenthrin
- Copper
- Fipronil Sulfone
- Malathion
- Permethrin
- Pyrethroids
- Toxicity

Total Maximum Daily Loads (TMDL)

The Central Valley RWQCB assessed all readily available data for waters in the Central Valley Region. The 2020-2022 Integrated Report was adopted by the SWRCB on January 19, 2022, and approved by U.S. EPA on May 11, 2022 (SWRCB 2022). According to the 2020-2022 Integrated Report, Arcade Creek, which is located within the Project area, is included in the 303(d) list and considered a Category 5 waterbody. The criteria for Category 5 are the following: a water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment. The pollutants listed for this segment, along with additional information, are included in Table 3. Arcade Creek 2020-2022 303(d) List below.

Table 3. Arcade Creek 303(d) List

Pollutant **Potential sources**	**Estimated Area Assessed**	**First Year Listed**	**TMDL Requirement Status***	**Date****
Chlorpyrifos Urban Runoff/Storm Sewers	9.9 miles	1998	5B	2004
Copper A Source Unknown	9.9 miles	2002	5A	2021
Diazinon Agriculture, Urban Runoff/Storm Sewers	9.9 miles	1998	5B	2004
Malathion Agriculture, Urban Runoff/Storm Sewers	9.9 miles	2010	5A	2021
Pyrethroids Urban Runoff/Storm Sewers	9.9 miles	2010	5A	2021
Sediment Toxicity A Source Unknown	9.9 miles	2010	5A	2021

*TMDL requirement status definitions for listed pollutants are: A= TMDL still required

**Dates relate to the TMDL requirement status, so a date for A= TMDL scheduled completion date, B= Date USEPA approved TMDL, and C= Completion date for action other than a TMDL

Source: SWRCB 2022

Groundwater Quality Objectives/Standards and Beneficial Uses

The key groundwater quality objective for the region is minimizing the contaminants reaching any groundwater basin. The goals are to control taste and odors, keep bacteriological, radioactive, chemical quality below the regulatory limits, and prohibit discharges of toxic wastes. Beneficial uses of groundwater in the Sacramento and San Joaquin River Basin Plan are considered as suitable or potentially suitable, at a minimum, for municipal and domestic supply (MUN), industrial service supply (IND), agriculture supply (AGR) and industrial process supply (PRO) (Central Valley RWQCB 2019).

4 ENVIRONMENTAL CONSEQUENCES

4.1 Potential Impacts to Water Quality

Project activities such as construction of the multi-use trail would create new impervious surfaces. This would result in an incremental reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff, potentially generating additional sediment runoff during storm events which could degrade the quality of receiving waters. During storm events, sediment is transported via runoff to stormwater drainage systems. Absent controls, contaminated runoff waters could flow into the stormwater drainage systems that discharge into rivers, agricultural ditches, sloughs, and channels and ultimately could degrade the water quality of any of these water bodies.

The project would result in an increase of approximately 0.47 acre of paved surface area, which would contribute to an increase in the volume of storm water runoff from the multi-use trail surface that could enter the drainage system and eventually the waterways within the project area. Impacts to water quality may result from sediment-laden storm water discharged into these waterways. Although the proposed trail would potentially increase storm water runoff as a result of additional impervious surfaces, the project would adhere to all applicable Phase I MS4 NPDES requirements regarding hydromodification. With the inclusion of permanent treatment control BMPs, as specified by Avoidance and Minimization Measure **WQ-1** through **WQ-4**, long-term project impacts to water quality are anticipated to be minimal.

Construction of the project would necessitate permanent impacts of 0.01 acres and temporary impacts of 0.10 acre of jurisdictional waters of the U.S. and State to facilitate the installation of the gabion baskets to reinforce the bank of Arcade Creek (Figure 5). The project anticipates acquiring a non-notifying USACE Nationwide 14 permit and a RWQCB Section 401 Water Quality Certification prior to the start of construction. A Section 1602 Streambed Alteration Agreement would also be acquired from the CDFW. There is the potential for a negligible increase in drainage discharge into Arcade Creek which is 303(d) listed for pesticides and heavy metals, due to increased impervious surfaces from the multi-use trail. Avoidance and Minimization Measures **WQ-1** through **WQ-5** would be implemented to minimize potential impacts to water quality.

4.1.1 Long Term Impacts and Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

Suspended Particulates (Turbidity)

The project is anticipated to include permanent treatment control BMPs per Avoidance and Minimization Measures **WQ-1** through **WQ-4**. As a result, the project is not anticipated to produce long-term turbidity.

Oil, Grease and Chemical Pollutants

The proposed project is a multi-use trail for pedestrians and bicyclists. Runoff generated from increased impervious surfaces due to construction of the bike trail would primarily

consist of sediment from erosion and is not anticipated to contain oil, grease, or chemical pollutants. Further, with the inclusion of permanent treatment control BMPs, as specified by Avoidance and Minimization Measure **WQ-1**, project impacts to water quality would not be substantial.

Flood Control Functions

The proposed project is located within three zones: Zone X and Zone AE. Zone X signifies a minimal flood hazard area with a 0.2% annual chance of flooding. Zone AE designates areas that are within the 100-year base flood zone and have a 1% annual chance of flooding. A Location Hydraulic Study will be prepared to ensure the design of the crossing addresses flood control function.

4.1.2 Anticipated Changes to the Biological Characteristics of the Aquatic Environment

Project features adjacent to the wetland and drainage features are not anticipated to change the biological characteristics of the aquatic environment. Construction of the project would necessitate permanent impacts of 0.01 acres and temporary impacts of 0.10 acre of jurisdictional waters of the U.S. and State to facilitate the installation of the gabion baskets to reinforce the bank of Arcade Creek (Figure 5). The project anticipates acquiring a non-notifying USACE Nationwide 14 permit and a RWQCB Section 401 Water Quality Certification prior to the start of construction. A Section 1602 Streambed Alteration Agreement would also be acquired from the CDFW. Avoidance and Minimization

Measures **WQ-2** through **WQ-4** are anticipated to minimize change to the biological characteristics of the aquatic environment.

4.1.3 Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

Human uses, such as recreation navigation or conservation are not primary functions of the aquatic features within the study area. No changes to human uses would occur and the waterways would continue to convey water through the region.

Given the characteristics of this project, and the existing conditions of the waterways present, existing and potential water supplies, water conservation, recreation, navigation, and aesthetics are not likely to be negatively impacted as a result of the project.

Biological Study Area (28.85 acres)
Elderberry Shrubs
Bridge
Trail Improvements
Gabion Basket
Retaining Wall
Curb Ramp
Pavement Marking
Pedestrian Refuge

Permanent Impacts
Annual Grassland (0.20 acre)
Oak Woodland (0.02 acre)
Perennial Stream Channel (0.01 acre)
Riparian Woodland (0.20 acre)

Temporary Impacts
Annual Grassland (0.28 acre)
Oak Woodland (0.17 acre)
Perennial Stream Channel (0.10 acre)
Riparian (0.89 acre)

Waters and Vegetation Communities
Annual Grassland (2.36 acres)
Water Quality/Detention Basin (1.20 acres)
Oak Woodland (0.51 acre)
Perennial Stream Channel (1.91 acres)
Riparian Woodland (8.88 acres)
Urban (13.99 acres)

Costco Wholesale
Walmart Supercenter
Arcade Creek Tributary
Community Drive
Sylvan Valley Way
Sylvan Road
Sylvan Creek Court
Park Drive
Arcade Creek
Arcade Creek Mainstem
Hespera Way

V:\3407_Arcade_Cripple_Creek_Trail\Biology\Biology.aprx
Dokken Engineering 2/2/2026; Created By: cclarkson
Source: Microsoft, Vantor

N

0 75 150 Feet

Figure 5
Project Impacts
Arcade-Cripple Creek Trail (Sylvan to Stock Ranch) Extension Project
Citrus Heights, Sacramento County, California

4.1.4 Short Term Impacts During Construction

Construction-related earth-disturbing activities of the proposed project would introduce the potential for increased erosion and sedimentation, with subsequent effects on water quality and storm drain capacity. During site grading, trenching, and other construction activities, areas of bare soil would be exposed to erosive forces during rainfall events. Bare soils are much more likely to erode than vegetated areas because bare areas lack dispersion, infiltration, and retention properties covering vegetation provides. Absent actions to minimize erosion, the extent of the impacts would be dependent on soil erosion potential, type of construction practice, extent of disturbed area, timing of precipitation events, and topography and proximity to drainage channels. In addition, construction equipment and activities would have the potential to leak hazardous materials, such as oil and gasoline, and potentially affect surface water or groundwater quality. Improper use or accidental spills of fuels, oils, and other construction-related hazardous materials, such as pipe sealant, solvents, and paints, could also pose a threat to the water quality of local water bodies. These potential leaks or spills, if not contained, would be considered a potentially significant impact on ground and surface water quality. Without precautions to contain or capture sediments or accidental hazardous spills, construction activities could produce substantial pollutants in stormwater runoff and result in a significant impact on the existing surface water quality. The proposed project would implement **WQ-1** through **WQ-4** to minimize construction-related impacts.

4.2 Cumulative Impacts

The Project would not result in a cumulatively considerable contribution to water quality impacts. The multi-use trail segment was previously planned and programmatically evaluated as part of the City's 2015 Bikeway Master Plan, which anticipated incremental trail improvements throughout the City, including trail upgrades within greenbelt corridors such as Arcade Creek. As such, the Project represents an implementation-level component of an adopted planning framework rather than a new or unanticipated source of water quality effects.

Although construction would introduce approximately 0.47 acre of new impervious surface and involve temporary ground disturbance and vegetation removal, these effects would be short-term and localized. Standard construction activities have the potential to generate sediment during rainfall events; however, these effects are common to many public infrastructure projects and are adequately controlled through compliance with applicable City and state stormwater regulations.

The Project includes a gabion basket retaining wall along an actively eroding reach of Arcade Creek, which would stabilize the bank and reduce existing sediment inputs to the creek. Permanent impacts associated with the gabion baskets would be limited to approximately 0.01 acre, with temporary impacts of approximately 0.10 acre related to construction access. The prefabricated bridge crossing would be installed without dewatering or in-channel work, and all abutments would be located outside the ordinary

high water mark of the Arcade Creek tributary, avoiding direct disturbance to aquatic resources.

The Project would be required to comply with standardized City and state water quality and stormwater best management practices as well as project-specific avoidance and minimization measures (**WQ-1** through **WQ-4**). These measures include erosion and sediment controls, stabilization of exposed soils, and debris management, which collectively ensure that sedimentation and pollutant discharges are minimized during construction and operation.

When considered in combination with other past, present, and reasonably foreseeable projects in the Arcade Creek watershed, the Project's contribution to cumulative water quality impacts would be minimal. The limited extent of new impervious surface, absence of in-channel work, incorporation of bank stabilization, and adherence to regulatory BMPs ensure that any incremental effects would not be cumulatively considerable.

5 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

WQ-1: The proposed project will require a National Pollution Discharge Elimination System (NPDES) General Construction Permit for Discharges of storm water associated with construction activities (Construction General Permit 2022-0057-DWQ). As part of this Permit requirement, a SWPPP shall be prepared prior to construction consistent with the requirements of the RWQCB. This SWPPP will incorporate all applicable BMPs to ensure that adequate measures are taken during construction to minimize impacts to water quality.

WQ-2: To conform with water quality requirements, the SWPPP must include the following:

- Vehicle maintenance, staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants must be a minimum of 50 feet from surface waters. Any necessary equipment washing must occur where the water cannot flow into surface waters.
- The project specifications will require the contractor to operate under an approved spill prevention and clean-up plan;
- Construction equipment will not be operated in flowing water;
- Construction work must be conducted according to site-specific construction plans that minimize the potential for sediment input to surface waters;
- Raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life must be prevented from contaminating the soil or entering surface waters;
- Equipment used in and around surface waters must be in good working order and free of dripping or leaking contaminants; and,
- Any concrete rubble, asphalt, or other debris from construction must be taken to an approved disposal site.

WQ-3: Prior to the start of construction activities, the project limits in proximity to jurisdictional waters must be marked with high visibility Environmentally Sensitive Area (ESA) fencing or staking to ensure construction will not further encroach into jurisdictional waters.

WQ-4: Contract specifications will include the following Best Management Practices (BMPs), where applicable, to reduce erosion during construction:

- Existing vegetation will be protected in place where feasible to provide an effective form of erosion and sediment control;
- As a permanent BMP, slope roughening by equipment tracking will be implemented to create unevenness on bare soil. Surface roughening reduces erosion potential by decreasing runoff velocities, trapping sediment, and increasing water infiltration.

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6.2 Preparer(s) Qualifications

Amy Bakker, B.S. in Environmental Science, 15 years of experience in environmental analysis.

Dorienne Mendoza, B.S. in Conservation and Resource Studies, Area of Interest in Sustainable Land Development, 8 years of experience in environmental analysis.

APPENDIX A NRCS SOIL SURVEY

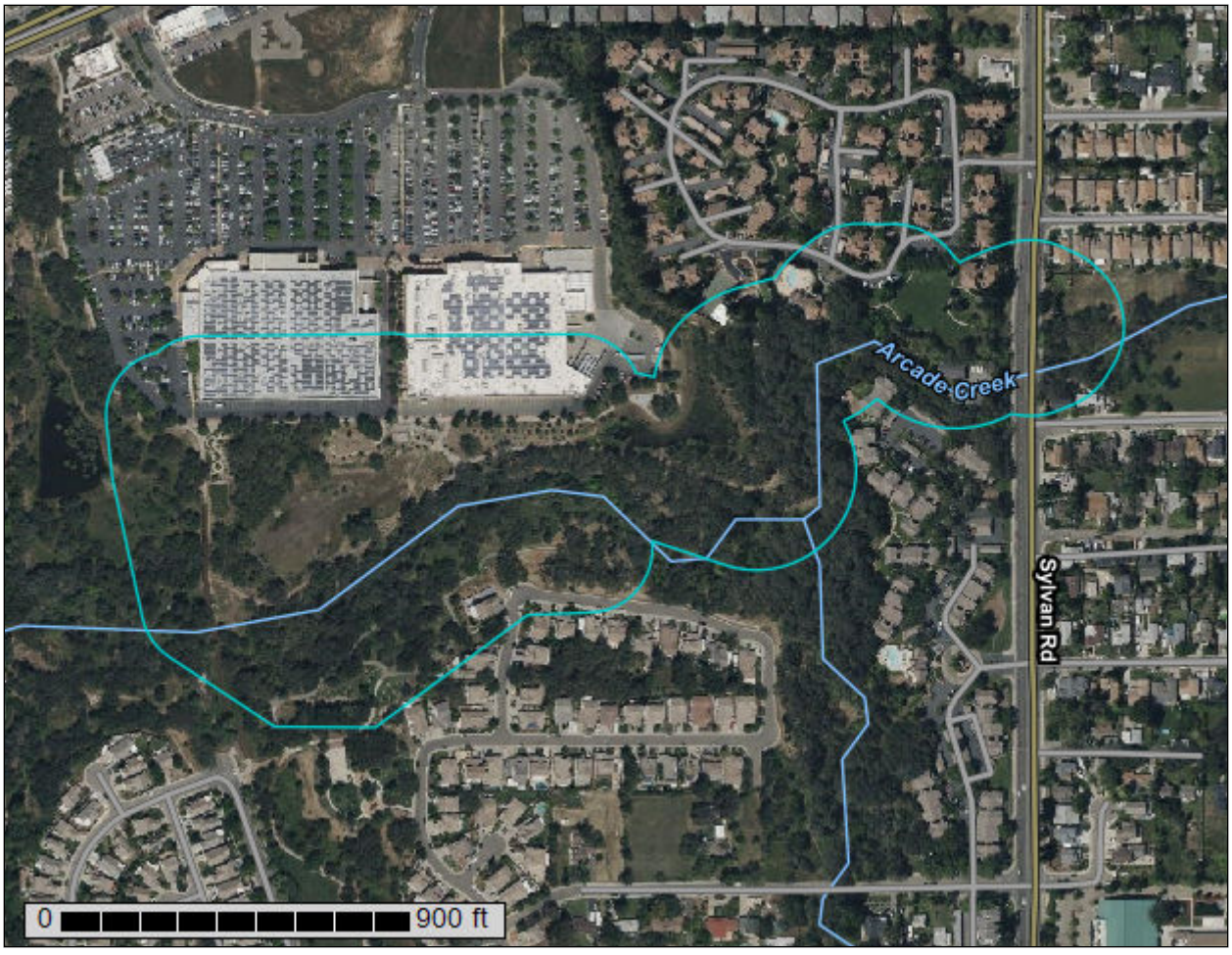
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Sacramento County, California



October 10, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sacramento County, California
Survey Area Data: Version 26, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
147	Fiddyment-Orangevale complex, 2 to 8 percent slopes	39.8	95.5%
148	Fiddyment-Orangevale-Urban land complex, 2 to 8 percent slopes	1.9	4.5%
Totals for Area of Interest		**41.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sacramento County, California

147—Fiddyment-Orangevale complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hhmq
Elevation: 50 to 280 feet
Mean annual precipitation: 19 to 22 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Fiddyment and similar soils: 55 percent
Orangevale and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fiddyment

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 15 inches: loam
H3 - 15 to 28 inches: sandy clay loam
H4 - 28 to 40 inches: indurated
H5 - 40 to 44 inches: material

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 28 to 40 inches to duripan; 40 to 44 inches to densic material
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Orangevale

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 20 inches: coarse sandy loam
H3 - 20 to 72 inches: sandy clay loam
H4 - 72 to 80 inches: coarse sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Minor Components

Kaseberg

Percent of map unit: 4 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Xerarents

Percent of map unit: 4 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Urban land

Percent of map unit: 3 percent

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, deeper

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Unnamed, steeper slopes

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

148—Fiddyment-Orangevale-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hhmr
Elevation: 50 to 280 feet
Mean annual precipitation: 19 to 22 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Fiddyment and similar soils: 40 percent
Orangevale and similar soils: 25 percent
Urban land: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fiddyment

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 15 inches: loam
H3 - 15 to 28 inches: sandy clay loam
H4 - 28 to 40 inches: indurated
H5 - 40 to 44 inches: material

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 28 to 40 inches to duripan; 40 to 44 inches to densic material
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: No

Description of Orangevale

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 20 inches: coarse sandy loam
H3 - 20 to 72 inches: sandy clay loam
H4 - 72 to 80 inches: coarse sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R017XY904CA - Subirrigated Deep Alluvial Fans
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Kaseberg

Percent of map unit: 6 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Xerarents

Percent of map unit: 6 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, steeper slopes

Percent of map unit: 3 percent
Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

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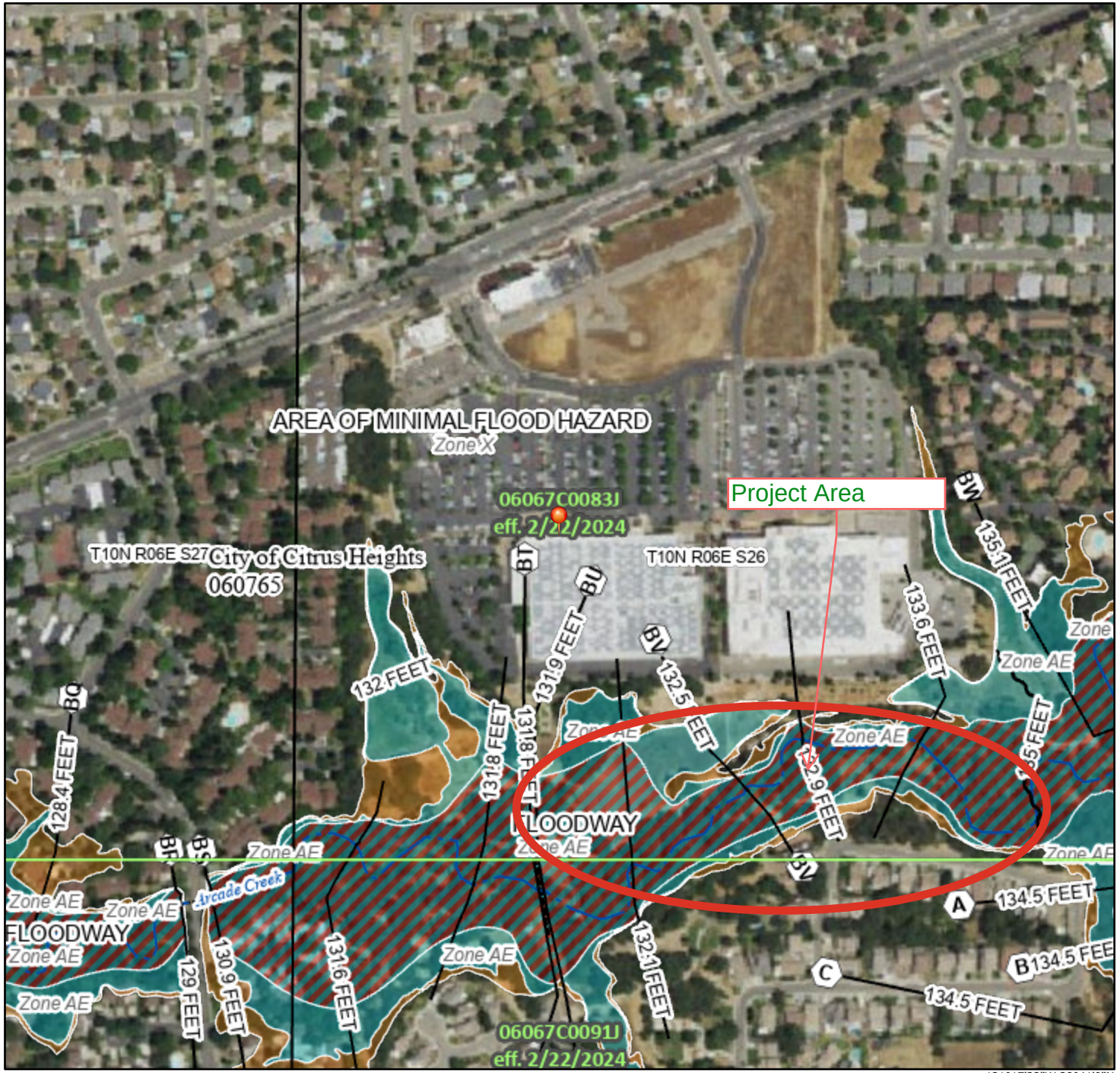
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APPENDIX B FEMA FIRMETTE MAP

National Flood Hazard Layer FIRMette

FEMA

121°18'10"W 38°41'38"N



121°17'32"W 38°41'9"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

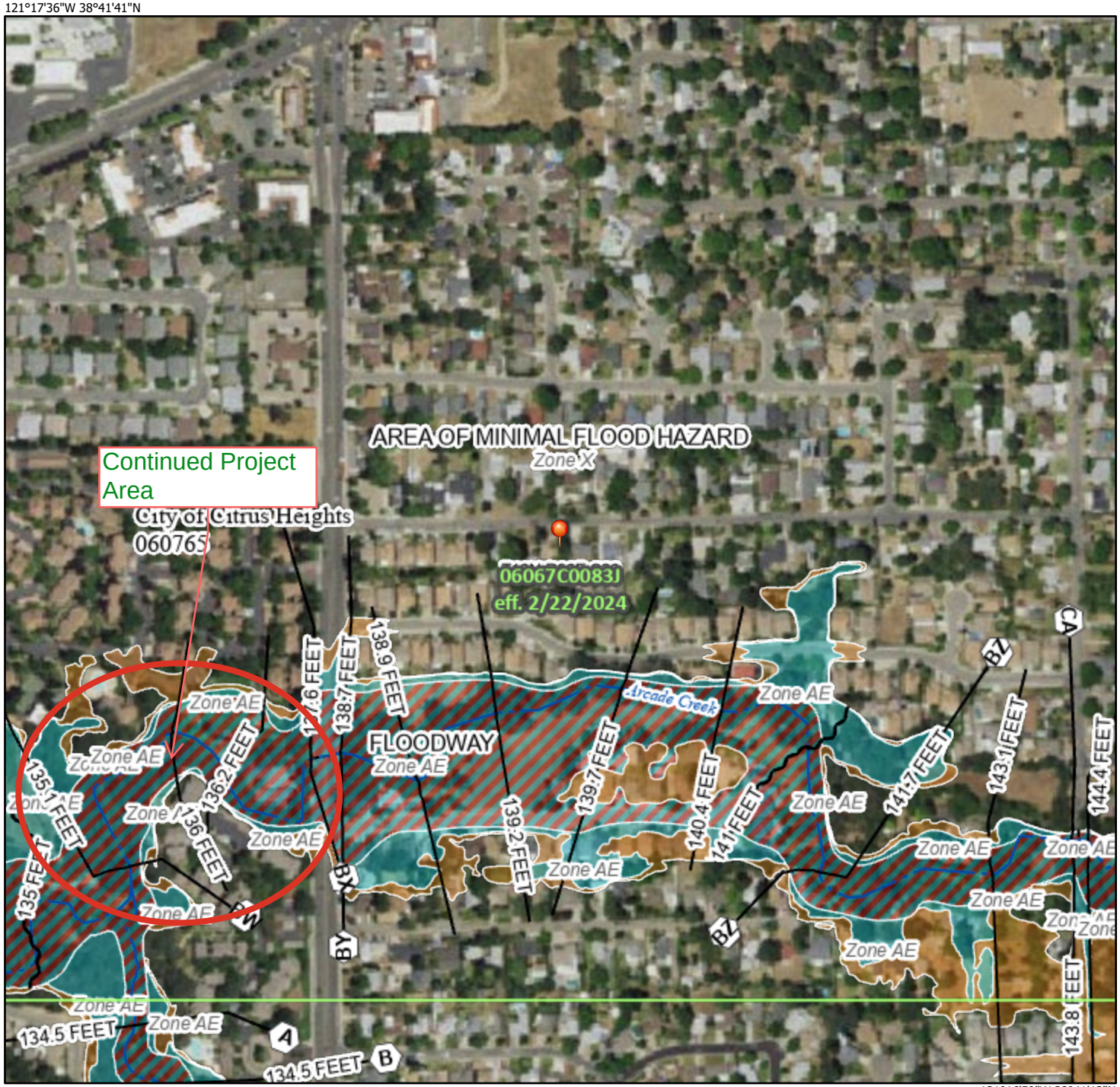
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/23/2025 at 12:30 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

121°17'36"W 38°41'41"N



121°16'59"W 38°41'13"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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